HOW TO PREDICT YOUR TESTOSTERONE LEVELS BETTER THAN YOUR PHYSICIAN CAN - FOR MALE PATIENTS OF TRT

TESTOSTERONE HALF-LIVES; METABOLISM AND DEGRADATION RATE

### Amount of Drug Left in the Body

<table>
<thead>
<tr>
<th>Milligrams Remaining</th>
<th>Percentage of Initial 200mg Injection Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start *** (200mg injection cypionate or enanthate)</td>
<td>100%</td>
</tr>
<tr>
<td>End of 1\textsuperscript{st} half-life</td>
<td>50.0%</td>
</tr>
<tr>
<td>End of 2\textsuperscript{nd} half-life</td>
<td>25%</td>
</tr>
<tr>
<td>End of 3\textsuperscript{rd} half-life</td>
<td>12.512.5%</td>
</tr>
<tr>
<td>End of 4\textsuperscript{th} half-life</td>
<td>6.25%</td>
</tr>
<tr>
<td><strong>End of 5\textsuperscript{th} half-life</strong>*</td>
<td>3.125%</td>
</tr>
<tr>
<td>End of 6\textsuperscript{th} half-life</td>
<td>1.56%</td>
</tr>
<tr>
<td>End of 7\textsuperscript{th} half-life</td>
<td>0.78%</td>
</tr>
</tbody>
</table>

***Most Literature Uses this phase when calculating 1/2 lives for almost ALL drugs. These types of drugs (1st order reactions) are a category of drug metabolism that is very predictable. This is very convenient for determining proper dose of T based on lab values and patient target ranges.

It is fair to say that 5 1/2 lives is the number of doses needed for any given drug of this type (first order reactions) to reach “STEADY-STATE”.

***For the sake of argument an to clarify an even understanding, WE are assuming a 1/2 life herein “HL” of 7 days for both T.Cypionate and T.Enanthate (Note: depending on where and what you read...various literature states between 4-8 days for Testosterone Cypionate herein “TC”, and 5-7 days for Testosterone Enanthate herein “TE”).
TESTOSTERONE HALF-LIVES OF T.CYPIONATE AND T.ENANTHATE

Drug Metabolism: Elimination Is Virtually Complete by the 5th Half-Life

In order to understand the activity of testosterone injections in the body it is important to define what the Half-Life (HL) is. The HL is essential to defining the right dose for an individual based on the reference lab results.

The reference range at the start of therapy determines the dose that will most quickly bring the safest results. If the dose is too low results may take what seem like forever and patients may choose to quit therapy with the mistaken belief that TRT does not work. In order to avoid this mishap and to accurately determine what dose will work all you need to know is the reference range starting point – which the correct lab order will provide and, the correct application of HL knowledge to your prescribed dose. This
type of information is not difficult to determine. If you consider the graph on page one you will see that any single dose of T will be degrades by the time five HLs pass by. In the case of long acting formulations of T such as TC and TE, that means 5 x 3.5 days = 14.25 days or roughly two weeks.

What does this mean? Well if you have been prescribed a frequency of injection 1x every 2 weeks on TC or TE, then you are walking into a T depleted crash over and over again. The reason for this is that by the time you take your next shot, there is hardly any T left in your body.

The purpose is optimization, remember? I believe some docs need to remember this important fact. (The drug behavior of intramuscular T ester formulations are governed by basic laws of pharmacokinetic 1st order reactions.)

In any event, the best and most simple way to configure a sensible dose and dosing regimen is to base it off sound facts that are known about long-acting T esters like T.Cyp and T.enth.

First, the half-life is listed in most literature from as little as 4 days to as many as 8 days for both esters. In reality a few factors such as age and race have been documented to show trends that affect the speed of testosterone break-down in the body.

The higher your age, the more likely you have a lower “apparent metabolic clearance rate” or AMCR of testosterone. All this means is that if all else is equal, a 35 year old male TRT patient and a 55 year old TRT patient will metabolize the same standard 200mg of T. Enth or T. Cyp at different rates. I mention the AMCR to get you ahead of the pack awareness-wise, not to confuse you. Just know that aging prolongs the half-life of any given dose of Testosterone - regardless of ester form. Whatever the dose, the HL can be up to 33% slower to breakdown. The AMCR will be referenced at some point in future articles as well as how to apply it to your specific age-bracket.

For now lets go over a few guidelines that will help you calculate your T levels under normal circumstances. It...
goes without saying but we will say it anyway for the few that may not have realized this: T levels will always be highest on the first and second day after an I.M. shot of long-acting T. The lowest levels will be the day just prior to the next injection.

So how do we use this information to our advantage? For starters how good or great you feel in the days following your injection should now make more sense. Typically the brain tells the body that everything is good and ‘lively’ when androgen (T levels) are rising from the shot. As the peak of the injection becomes a brief plateau the androgen level begins to decline back to baseline.

Males prescribed <100mg/week shots will often begin to feel anywhere from ehhhh...to downright crappy at this time. Especially if no hCG is included in the regimen. (for those who are not familiar - hCG is given to keep the production of testosterone and sperm from completely shutting off during TRT).

Telltale signs of insufficient dosing of T is feeling crappy during the second half of the week following your injection. If this is you the way to fix it would be to keep a small diary and record when you begin to feel crappy with a short description of symptoms. If you find it is always during the second half of the week, you need to go get T and E2 measured at the lab on day 6 of your 7 day rotation. If you are the average TRT male patient and you are >40 years of age, you want your T level to still be above 450 ng/dL on day 6 of your 7 day injection/rotation regimen. This is otherwise known as the ‘trough’ when describing the T pharmacokinetics (way the drug behaves in the body).

When testing like this to pinpoint T and E2 levels you will save you lots of unnecessary lab expenses. Make sure to tell your doc what you
The Threshold of T at the Time of ‘Trough’ Levels Determines Stability of Treatment

want in this specific case.

Recall that it takes five injections at the new dose before the ‘new’ therapeutic blood level will be stable. So you will likely feel better after the dose increase but benefits will be cumulative for the first 5-6 weeks until the level is reached.

If it turns out that your previous dose was too low, you will likely feel better just after the very first dose, but less ‘good’ towards the end of the week. The reason again is due to the peak blood level of the new dose leveling off and coming back down to the old baseline.

Lets say you were on the commonly insufficient dose of 100mg/week of cypionate and the trough at day 6 was previously 400ng/dL. After the first injection of 150mg your T level would likely be above the range on day 2 and 3 after the injection and then bottom out around 450-500ng/dL. This is only an estimate and although you can calculate the ‘on-paper’ blood level, life rarely works out exactly as planned due to individual genetics, life habits, etc. Lets say the new trough eventually levels off at around 700ng/dL and the peak is somewhere around 1300ng/dL(after 5 weeks at the new dose).

What should happen in the interim should be a progressive ‘lack of feeling crappy’ towards the end of your week. This is due to the new ‘trough’ level being established by the larger 150mg TC injections. Many times it takes some practice regarding finding the right dose for each patient. Noticeable effects depend heavily on T-threshold: more or less this is your genetic requirement for T levels that allow full T-related functions.

Typically, the T level rises slightly above lab reference ranges at the peak and falls to below the baseline at the ‘trough’.

At trough levels of 500-700ng/dL, most male patients will have met their threshold for T, and will begin to notice benefits of T-therapy.

Below is an example of what happens in the blood after a single injection of TC when
The Threshold of T at the Time of ‘Trough’ Levels Determines Stability of Treatment

starting T-therapy. Because the body is deficient in testosterone at the start, any therapeutic effect of the injection will not take significant (noticeable) effect until the blood level is elevated to your critical threshold that is somewhere in the upper half of the lab reference range (See Pink on Graph Below >500ng/dL).

Due to the slow yet cumulative and progressive actions of T, levels must be maintained above threshold for sustained period of time before the body begins to normalize function(s). Lack of a stable/therapeutic T level from dosing along with poor or zero estrogen management is the number one cause for lackluster TRT responses. This is your TAKE-HOME POINT. You must reach what is known as the “clinical end point” with your TRT regimen. It takes 5 injections of TC or TE to reach therapeutic level for that dose. This will be explained further when we discuss ‘–order’ drug metabolism in next month’s edition of ASPEDR.

Bottom line - T levels must be maintained above threshold and estrogen must be managed through pharmaceutical and nutritional means that allow the proper ratios and activities of these two critical hormones.

For additional information on TRT and AAS: www.sportspecificsteroids.com.
For more on estrogen management in men: www.knowledge-download.com/5115.